

CLAIMS

1. (Currently amended) An FM transmitter with integrated modulator used to transfer text data from an auxiliary audio device to an FM receiver comprising:
 - a processor, coupled to the auxiliary audio device, that receives the configured to receive text data associated with an audio signal and to convert the text data into digitally encoded speech to be transmitted to the FM receiver and processes the data to develop a processed data signal;
 - a signal combiner that combines configured to combine the processed data signal digitally encoded speech with an the audio signal into a combined signal; provided by the consumer electronic device and
 - an FM encoder configured to encode the combined signal encoded according to a frequency modulation (FM) an FM standard to generate a composite into an FM signal; and for transmission to the FM receiver
 - a transmitter configured to transmit the FM signal.
2. (Currently amended) An integrated FM transmitter according to claim 1, the signal combiner referred to as a first signal combiner, wherein:
 - the processor is configured to process the convert the text data signal according to a radio data system (RDS) standard to generate a modulated RDS signal as the processed data signal; and
 - the further comprising a second signal combiner configured to combine the modulated RDS signal into the FM signal sums the processed data signal and the encoded audio signals.
3. (Currently amended) An integrated FM transmitter according to claim 2, wherein the processor is a programmed processor comprising including software that code to control controls the processor to generate the modulated RDS signal as the processed data signal.
4. (Currently amended) An integrated FM transmitter according to claim 2, further comprising including:

an analog FM stereo encoder which generates configured to generate the an analog FM encoded audio signal as an analog the FM encoded audio signal;

a digital to analog converter coupled to the processor and configured to convert receive the processed data modulated RDS signal and to provide an analog data modulated RDS signal corresponding to the processed data signal; and

a band-pass filter configured to filter that filters the analog data modulated RDS signal to exclude signal components outside of a range of frequencies acceptable for according to an RDS standard modulated signal;

wherein the signal combiner sums is configured to combine the band-pass filtered analog data modulated RDS signal and into the analog FM signal to produce the composite FM signal.

5. (Currently amended) An integrated FM transmitter according to claim 2, wherein:

the processor is configured to receive a digital audio input signal as the audio signal and to encode the digital audio signal to provide a digital FM encoded audio signal; and

the FM encoder, the first signal combiner, and the second signal combiner is summing circuitry are implemented in the processor that sums the digital FM encoded audio signal and the modulated RDS signal to generate the composite FM signal.

6. (Currently amended) An integrated FM transmitter according to claim 1, wherein:

the processor is configured to convert the text data into speech to provide a speech signal and to encode the speech signal as an FM data signal to provide the FM data signal as the processed data signal; and

the signal combiner is configured to time-division multiplex multiplexes the digitally encoded speech FM data signal and the FM encoded audio signal to generate the composite FM combined signal.

7. (Currently amended) An integrated FM transmitter according to claim 6, wherein the processor is a programmed processor including comprising code to control software that controls the processor to convert the text data into the digitally encoded speech to provide the

~~speech and to encode the speech signal as an FM data signal to provide the FM data signal as the processed data signal.~~

8. (Currently amended) An integrated FM transmitter according to claim 6, wherein:

the processor is configured to receive a digital audio ~~input~~ signal as the audio signal and to ~~encode the digital audio signal to provide a digital FM encoded audio signal;~~ and

the signal combiner is comprises multiplexing circuitry in the processor that ~~to time-division multiplex~~ multiplexes the digital FM ~~encoded~~ audio signal and the digitally encoded speech FM data signal to generate the composite FM combined signal.

9. (Currently amended) An integrated FM transmitter according to claim 1, wherein:

an auxiliary audio device is configured to generate the audio signal; and
the processor is ~~the~~ a control processor of the auxiliary audio device.

10. (Currently amended) An integrated FM transmitter according to claim 9, wherein the auxiliary audio device is a device selected from a group consisting of a CD player, a CD-MP3 player, a universal satellite receiver, and a digital audio broadcast receiver.

11. (Currently amended) An integrated FM transmitter according to claim 10, further comprising ~~including~~ a wireless remote control receiver, coupled to the auxiliary audio device, the wireless remote control receiver to receive commands to control the auxiliary audio device and to receive commands to select text data to be transmitted to in the FM signal receiver.

12. (Currently amended) An integrated FM transmitter according to claim 1, further comprising:

a housing to which the processor, the signal combiner, the FM encoder, and the transmitter are mounted, the housing comprising:

an audio input to receive the audio signal from an auxiliary audio device; and
a data input to receive the text data from the auxiliary audio device;

wherein the housing is physically distinct from processor and signal combiner are implemented as a separate device that is configured to be attached to line and data output terminals of the auxiliary audio device.

13. (New) A transceiver, comprising:

a receiver configured to receive a broadcast audio transmission comprising text data and an audio signal;

a radio data system (RDS) modulator configured to generate a modulated text data signal in response to the text data;

a frequency modulation (FM) encoder configured to generate an FM encoded audio signal in response to the audio signal;

a signal combiner configured to combine the modulated text data signal and the FM encoded audio signal into a combined signal; and

an FM transmitter configured to transmit the combined signal.

14. (New) The transceiver of claim 13, wherein:

the receiver is a satellite audio receiver comprising a processor; and

at least one of the RDS modulator, the FM encoder, and the signal combiner are implemented in the processor of the satellite audio receiver.

15. (New) The transceiver of claim 13, further comprising:

a processor configured to convert the text data into digitally encoded speech and to combine the digitally encoded speech and the audio signal into a combined audio signal;

wherein the FM encoder is configured to generate the FM encoded audio signal in response to the combined audio signal.

16. (New) The transceiver of claim 15, wherein the processor is configured to time-domain multiplex the digitally encoded speech and the audio signal to generate to combined audio signal.

17. (New) The transceiver of claim 13, further comprising:

a housing in which the receiver and at least one of the RDS modulator, the FM encoder, the signal combiner, and the FM transmitter are mounted.

18. (New) The transceiver of claim 17, wherein each of the RDS modulator, the FM encoder, the signal combiner, and the FM transmitter are mounted in the housing.

19. (New) A handheld audio player, comprising:
a storage device;
a processor configured to receive an audio signal and associated text data from the storage device;
an audio output configured to output the audio signal in response to the processor; and
a frequency modulation (FM) transmitter configured to transmit the audio signal and the text data.

20. (New) The handheld audio player of claim 19, further comprising:
a radio data system (RDS) modulator configured to generate a modulated text data signal in response to the text data;
an FM encoder configured to generate an FM encoded audio signal in response to the audio signal; and
a signal combiner configured to combine the FM encoded audio signal and the modulated text data signal into a combined signal;
wherein the FM transmitter is configured to transmit the combined signal.

21. (New) The handheld audio player of claim 20, wherein at least one of the RDS modulator, the FM encoder, and the signal combiner are implemented in the processor.

22. (New) The handheld audio player of claim 19, wherein:
the handheld audio player is one of a compact disc (CD) player, a flash player, an MP3 player, and a hard disk drive (HDD) jukebox.

23. (New) The handheld audio player of claim 19, wherein:

the processor is configured to convert the text data into digitally encoded speech and to combine the digitally encoded speech and the audio signal into a combined audio signal; wherein the FM transmitter is configured to transmit the combined audio signal.

24. (New) The handheld audio player of claim 23, wherein the processor is configured to time-domain multiplex the digitally encoded speech and the audio signal to generate to combined audio signal.